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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
AGGARWAL, YOGESH K	

ART UNIT	PAPER NUMBER
2622	

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/018,283	SAARELMA, HANNU	
	Examiner	Art Unit	
	Yogesh K. Aggarwal	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *16-27* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments filed 01/18/2006 have been fully considered but they are not persuasive.

Examiner's response:

2. Applicant argues with regards to claim 1 that the combination of the disparate teachings of Matsuyama and Ohno is unjustified, and provides no reasonable basis to suggest Applicant's claimed invention in an obvious manner. The Examiner respectfully disagrees. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)]. (See MPEP 2143).

In this case, Matsuyama teaches that photoelectric elements that are arranged on the image surface such that their density is at a maximum on the optic axis and diminishes from the optic axis toward the edge zones **in order to use the sensor for both the study of the object in a wide field of view and for detailed study in a narrow field of view (col. 3 lines 11-18).** Therefore there is explicit motivation in the reference themselves (Matsuyama) to modify the references or to combine reference teachings. [The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)].

Second, Ohno teaches that negative distortion and image in the periphery of the field of view becoming smaller than that in the central portion, which results in the decrease of resolution (col. 5 lines 41-50) can be reduced. Matsuyama is also trying to reduce the problem of reduction in the quantity of marginal light in the marginal portion of the optical system (col. 1 lines 45-56), so one of ordinary skill in the art would have had a **reasonable expectation** that in combining the theories of Ohno and Matsuyama would have led to an even greater reduction of quantity of light in the marginal portion of the field of view.

Third, Ohno et al. teaches a camera system comprising a camera (col. 1 lines 10-11, figure 3) provided with an optics system (32 and 34) and a photosensitive image surface (35) disposed near the optics system symmetrically relative to its optic axis (See figure 3), the image of.the object refracted by the optics being projected onto the image surface , the photosensitive image surface (35) being a concave spherical surface (col. 4 lines 59-col. 5 line 5). Matsuyama et al. teach photoelectric converting portions 5 and 6 on a sensor 4 such that the mixture of a narrow area 10 (at the center near the optic axis, therefore higher density) and wide area 7 (at the periphery, therefore density decreases from the optic axis toward the edge zones, col. 2 line 66-col. 3 line 18).

Thus the three basic criteria required to establish a prima facie case has been met.

3. Applicant argues with regards to claims 4, 5 and 10-13 wherein Official Notice has been taken to substantiate with prior art references. Suzuki (US Patent # 5,485,004) discloses that the solid-state imaging device 4 performs photoelectric conversion of optical image information formed by the focus lens 1, and has a large number of pixels, typically 100,000 to 500,000 pixels

(col. 2 lines 38-42). Karube et al. (US Patent # 6,670,985) teaches a camera connected to a computer and is capable of taking still, moving pictures (See figure 10, col. 1 lines 8-13).

4. Applicant argues with regards to claim 6, 9, 14 and 15 that the secondary reference has no motivation to combine the two references. The Examiner disagrees. Broome et al. teaches an aperture stop 150 of an optical system 100 having four apertures to spread a point image (PSF) over more than one pixel in a detector array in order to reduce aliasing effects (col. 3 lines 35-45, col. 2 lines 32-49, figure 5). Suzuki teaches a fish-eye lens is designed with an intentionally large negative distortion, thereby achieving an imaging angle of 180.degree (col. 7 lines 63-67) in order to prevent the significant loss in the amount of light in the peripheral area. Nayar teaches an omnidirectional imaging apparatus (figure 7) having two cameras 110 and 710 facing in the same direction which is complementary to the hemispherical scene 130 so that they together constitute a spherical scene (col. 11 line 63-col. 12 line 4) in order to have a scene that is spherical or omnidirectional.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US Patent # 4,467,361) in view of Matsuyama et al. (US Patent # 5,796,095).

[Claim 1]

Ohno et al. teaches a camera system comprising a camera (col. 1 lines 10-11, figure 3) provided with an optics system (32 and 34) and a photosensitive image surface (35) disposed near the optics system symmetrically relative to its optic axis (See figure 3), the image of the object refracted by the optics being projected onto the image surface , the photosensitive image surface (35) being a concave spherical surface (col. 4 lines 59-col. 5 line 5). Ohno teaches that the solid-state image-sensing array is made of an array of sensors (col. 1 lines 60-63). Ohno et al. also teaches that the radius of curvature of the image sensor is chosen in such a way so that a sharp image can be obtained equal to the curvature of field (col. 5 lines 20-40 and abstract). Ohno fails to teach wherein the detecting elements are so arranged on the image surface that their density is at a maximum on the optic axis and diminishes from the optic axis toward the edge zones.

However Matsuyama et al. teach photoelectric converting portions 5 and 6 on a sensor 4 such that the mixture of a narrow area 10 (at the center near the optic axis, therefore higher density) and wide area 7 (at the periphery, therefore density decreases from the optic axis toward the edge zones, col. 2 line 66-col. 3 line 18).

Therefore taking the combined teachings of Ohno and Matsuyama, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have detecting elements that are so arranged on the image surface such that their density is at a maximum on the optic axis and diminishes from the optic axis toward the edge zones in order to use the sensor for both the study of the object in a wide field of view and for detailed study in a narrow field of view as taught in Matsuyama.

[Claim 2]

Re this claim, by comparing the density of pixels as claimed in claim 1 of the applicants with figure 1 of Matsuyama et al. it is apparent that since the same density pattern for CCD elements exists, the same mathematical relationship exists between the two. Therefore it is considered that if density pattern is the same, the mathematical relationship would inherently be the same as recited in this claim.

[Claim 3]

Ohno teaches that the solid-state image-sensing array is made of an array of CCD elements (col. 1 lines 60-63).

[Claim 7]

Ohno et al. teaches an objective lens of focal length field and field of view to be 90 degrees or less (col. 5 lines 6-17) and a stop (33) disposed between the optics (32) and image sensor (35).

[Claim 8]

Ohno teaches that the field of view is more than 90 degrees (col. 5 lines 38-40). Image surface shown in figure 3 is less than a hemisphere shape, therefore the field of view will be less than 180 degrees.

7. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US Patent # 4,467,361), Matsuyama et al. (US Patent # 5,796,095) and in further view of Suzuki (US Patent # 5,485,004).

[Claims 4 and 5]

Ohno in view of Matsuyama fails to teach have photodetecting elements in the order of 100000 and as the number of photodetecting elements increase the quality of the picture increases. However Suzuki discloses that the solid-state imaging device 4 performs photoelectric

conversion of optical image information formed by the focus lens 1, and has a large number of pixels, typically 100,000 to 500,000 pixels (col. 2 lines 38-42). It is noted that as the number of photodetecting elements increase the quality of the picture increases because the resolution increases. Therefore taking the combined teachings of Ohno, Matsuyama and Suzuki, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have photodetecting elements in the order of 100000 and as the number of photodetecting elements increase the quality of the picture increases in order to have a picture with better results and pleasing to the viewer.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US Patent # 4,467,361), Matsuyama et al. (US Patent # 5,796,095) and in further view of Broome et al. (US Patent # 6,178,046).

[Claim 6]

Matsuyama et al. teach photoelectric converting portions 5 and 6 on a sensor 4 such that the mixture of a narrow area 10 (at the center near the optic axis, therefore higher density) and wide area 7 (at the periphery, therefore density decreases from the optic axis toward the edge zones, col. 2 line 66-col. 3 line 18). Ohno in view of Matsuyama fails to teach that the point spread function (PSF) produced by the optics integrates over several detecting elements to prevent aliasing.

However Broome et al. teaches an aperture stop 150 of an optical system 100 having four apertures to spread a point image (PSF) over more than one pixel in a detector array in order to reduce aliasing effects (col. 3 lines 35-45, col. 2 lines 32-49, figure 5).

Therefore taking the combined teachings of Ohno, Matsuyama and Broome, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a point spread function (PSF) produced by the optics integrates over several detecting elements to prevent aliasing.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US Patent # 4,467,361), Matsuyama et al. (US Patent # 5,796,095) and in further view of Suzuki et al. (US Patent # 5,004,328).

[Claim 9]

Ohno in view of Matsuyama fails to teach a fish eye lens having a recording angle of 180 degrees. However Suzuki teaches a fish-eye lens is designed with an intentionally large negative distortion, thereby achieving an imaging angle of 180.degree (col. 7 lines 63-67) in order to prevent the significant loss in the amount of light in the peripheral area.

Therefore taking the combined teachings of Ohno, Matsuyama and Suzuki, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a fish-eye lens that is designed with an intentionally large negative distortion, thereby achieving an imaging angle of 180 degree in order to prevent the significant loss in the amount of light in the peripheral area.

10. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US Patent # 4,467,361), Matsuyama et al. (US Patent # 5,796,095) and in further view of Karube et al. (US Patent # 6,670,985).

[Claims 10-13]

Ohno teaches that the images can be transmitted to a display device 37 (monitor, figure 3) but fails to teach if the display device is for a computer and whether the camera is a still, moving or a monitoring camera. However Karube et al. teaches a camera connected to a computer and is capable of taking still, moving pictures (See figure 10, col. 1 lines 8-13)to have a display device for a computer and a camera that is still, moving or monitoring camera in order to display different kind of images remotely. Therefore taking the combined teachings of Ohno, Matsuyama and Karube, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a display device for a computer a camera having still, moving or a monitoring functions in order to display different kind of images remotely.

11. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US Patent # 4,467,361), Matsuyama et al. (US Patent # 5,796,095) and in further view of Nayar (US Patent # 6,118,474).

[Claims 14 and 15]

Ohno fails to teach wherein system comprises two adjacent semispace recording cameras directed in the same or opposite direction for the recording of a stereo image of the semi-space and for the recording of the whole space. However Nayar teaches an omnidirectional imaging apparatus (figure 7) having two cameras 110 and 710 facing in the same direction which is complementary to the hemispherical scene 130 so that they together constitute a spherical scene (col. 11 line 63-col. 12 line 4). It would be obvious to one skilled in the art to have cameras in opposite directions of Nayar.

Therefore taking the combined teachings of Ohno, Matsuyama and Nayar, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have

two adjacent semispace recording cameras directed in the same or opposite direction for the recording of a stereo image of the semi-space and for the recording of the whole space in order to have a scene that is spherical or omnidirectional.

Allowable Subject Matter

12. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K. Aggarwal whose telephone number is (571) 272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571)-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YKA
April 27, 2006

DAVID OMETZ
SUPERVISORY PATENT EXAMINER